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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/082,594 | 02/22/2002 | Alan R. Reinberg | MI22-1952 | 8480 |
| 21567 | 7590 | 12/03/2003 | EXAMINER | |
| WELLS ST. JOHN P.S. 601 W. FIRST AVENUE, SUITE 1300 SPOKANE, WA 99201 | | | LEE, HSIEN MING | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2823 | |

DATE MAILED: 12/03/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/082,594

Applicant(s)

REINBERG, ALAN R.

Examiner

Hsien-Ming Lee

Art Unit

2823

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 and 53-62 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7, 8, 11, 14-18, 54-57 and 60 is/are rejected.
- 7) ☒ Claim(s) 5, 6, 9, 10, 53, 58, 59, 61 and 62 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Remarks

1. The objection to specification, 112-second-paragraph rejection to 15-17 and 59 and double patenting rejection to claims 1-18 and 53-62 are withdrawn.
2. Claims 1-18 and 53-62 are pending in the application.

Grounds of Rejections

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-4, 7, 8, 11, 14-18, 54-57 and 60 are rejected under 35 U.S.C. 102(e) as being anticipated by DeBoer (US 6,326,277).

The applied reference has a *common assignee* with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

In re claims 1 and 55, DeBoer, in Fig.9 and related text, expressly teaches a method of forming a capacitor comprising:

- forming a capacitor storage node layer 134 over a substrate 187, the capacitor storage node layer 134 having an uppermost rim defining an opening 120 (i.e. the cavity) into an interior volume (Fig.9);
- forming a cap 150 (an insulative material layer) by capping at least a portion of the rim within the interior volume by forming a material 150 (i.e. an insulative material) which is different from the capacitor storage node layer 134 (i.e. HSG) over the rim portion (Fig.9); and
- forming a capacitor dielectric region 150 and a cell electrode layer 160 over the capacitor node layer 134 within the interior volume (Fig.9)

In re claim 2, DeBoer also teaches that the capping of the rim portion comprises forming an insulative material 150 thereover. (Fig.9)

In re claims 3 and 56, DeBoer also teaches that the capping of the rim portion comprises forming an insulative material 150 within less than an entirety of the interior volume (i.e. the interior volume of the opening 120) (Fig.9).

In re claims 4 and 57, DeBoer further teaches that the capping of the rim portion comprises forming an insulative material layer 150 over the substrate 187 and anisotropically etching the insulative material layer 150 by patterning (Fig.9).

In re claims 7 and 60, DeBoer also teaches that the forming of the capacitor storage node layer 134 comprises: forming a container 120 (i.e. the cavity) into a container-defining material 132/199 over the substrate 187; forming a capacitor storage node layer 134 within the container 120; and recessing the capacitor storage node layer 134 to below an uppermost surface of the container-defining material 132/199 (Fig.9).

In re claim 8, DeBoer further teaches that the capacitor storage node layer 134 comprises roughened polysilicon (i.e. HSG)(col.10, lines 14-16).

In re claim 11, DeBoer also teaches that the forming of the capacitor storage node layer 134 comprises: forming a container 120 into a container-defining material 132/199 over the substrate 187; forming a capacitor storage node layer 134 within the container 120; recessing the capacitor storage node layer 134 to below an uppermost surface of the container-defining material 132/199; and wherein the capping of the rim portion comprises forming an insulative material layer 150 over the substrate 187 and anisotropically etching the insulative material layer 150 by patterning (Fig.9).

In re claims 14, 15 and 54, DeBoer expressly and inherently teaches a method of forming a capacitor comprising: forming a capacitor storage node layer 134 over a substrate 187, the capacitor storage node layer 134 having an uppermost rim defining an opening 120 into an interior volume; forming a layer of material 150 over the uppermost rim within the interior volume (i.e. the interior volume of the opening 120); and further comprising anisotropically etching said layer of material 150 sufficient to leave a portion of the layer of material 150 occluding the opening 120 (Fig.9).

In re claims 16 and 17, DeBoer also teach anisotropically etching said layer of material 150 sufficient to leave a portion of the layer of material 150 extending into the interior volume and occluding the opening 120 (Fig.9).

In re claim 18, DeBoer teaches that the forming of the layer of material 150 comprises forming a portion of said layer of material 150 to contact the storage node layer 134 (Fig.9).

Allowable Subject Matter

5. Claims 5, 6, 9, 10, 53, 58, 59, 61 and 62 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record neither teaches nor suggest filling *less than* the interior volume with a filler material which is present during the capping (claims 5, 6, 58, 59); after the capping of the rim portion, *removing* some of the *container-defining material* (claims 9, 10, 61, 62); and forming a *capacitor dielectric region* over the capacitor storage node layer within the interior volume (claim 53).

Response to Arguments

7. Applicant's arguments filed 8/13/03 have been fully considered but they are not persuasive for the reasons as follow.

In re 102(e) rejection, applicant's argument is on the ground that the insulative material layer 150 of DeBoer cannot be interpreted as "a cap" because the insulative material 150 "**drapes** over an entirety of the storage node layer 134", which does not "teach or suggest the **ordinary and customary meaning of a cap**." (lines 7-15, page 14)

Contrary the argument, DeBoer does teach or suggest forming the cap 150 by capping at least a portion of the rim (i.e. the protruded portions on a top surface of hemispherical grained silicon or the storage node layer 134) within the interior volume (i.e. an opening within 128) by forming a material 150 (i.e. an insulative material) over the rim portion (Fig.9).

Since the insulative material 150 **covers the top or end of crown** (i.e. the rim or the protruded portions), the insulative material 150 can be interpreted as the “cap.” The Examiner disagrees that the insulative material 150 **drapes** over the storage node layer 134 (last two lines of page 140) because the insulative material 150 does **not rest or hang limply** over the storage node layer 134, wherein the definition of “drape” is from *WEBSTER'S II New Riverside University Dictionary*, page 403, 1984. The insulative material 150 is **chemically formed** over the underlying storage node layer 134, not **physically hang limply** over the storage node layer 134, which can be comprehended to the ordinary skilled in the art.

In re claim 4, applicants further argued that DeBoer does not teach or suggest anisotropically etching the insulative material layer 150. (third paragraph, page 15)

Contrary to the argument, DeBoer does teach forming the insulative material 150 in the interior volume and on entire top surface of layer 199 and anisotropically etching the insulative material 150 to form the container-type shape layer 150 as illustrated in Fig. 9.

Thus, the 102(e) rejection to claims 1-4, 7, 8, 11, 14-18, 54-57 and 60 is deemed proper.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hsien-Ming Lee whose telephone number is 703-305-7341. The examiner can normally be reached on M-F (9:00 ~ 5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on 703-306-2794. The fax phone number for the organization where this application or proceeding is assigned is 703-308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

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Nov. 19, 2003

Hsien-Ming Lee
Examiner
Art Unit 2823

A handwritten signature in black ink, appearing to be 'Hsien-Ming Lee', written in a cursive style.